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Observations of Near-Surface Oceanic Velocity Strain-Rate Variability during and after Storm Events

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ABSTRACT

During August of 1977, a series of repeated profiles of the upper ocean were made at Ocean Station Papa (145°W, 50°N) with a velocity/temperature microstructure profiler. A strong correlation of wind-speed variations with velocity structures in the 20 m deep mixed layer was observed. Rates of dissipation of mechanical energy as high as 5×10^{-2} ergs $\text{cm}^{-2} \text{s}^{-1}$ were observed during wind speeds of 20 m s^{-1} , and as low as instrumental noise ($\sim 10^{-6}$ ergs $\text{cm}^{-3} \text{s}^{-1}$) during light winds. A persistent vertical separation of temperature and velocity variance maxima at high wavenumbers was found near the base of the mixed layer, in a region of strong vertical shear, suggesting that show-induced entrainment continued for several days after the storm events subsided.

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